Safetygram

NCI-Frederick

ISM # 168 LABORATORY PERSONNEL JUNE 2004

OZONE DEPLETING SUBSTANCES

As you are probably aware, the ozone layer of the earth's atmosphere is in jeopardy. A significant amount of ozone has been depleted as a result of the release of certain chemical compounds into the air. Many consumer products have been reformulated to remove the offending compounds. In September 1987, twenty-three countries, including the United States, signed the "Montreal Protocol on Substances that Deplete the Ozone Layer". The Montreal Protocol requires that production and consumption of certain ozone-depleting substances be restricted according to a specified schedule. Two years after this initial agreement, these countries met again to address the additional scientific evidence that the ozone layer was disappearing at a faster rate than previously anticipated. The result of this meeting was an adjustment of the phase-out dates set in the first meeting. The majority of chemicals were phased out on January 1, 1996. The United States Congress passed the Clean Air Act Amendments of 1990, which imposed more stringent requirements on the control of ozone-depleting substances. 40 CFR 82 implements the Montreal Protocol and these subsequent amendments.

EHS has prepared a list of the chemical compounds affected by these regulations; it is printed on the back of this Safetygram. If you suspect that a solvent or product that you work with may be affected, please contact EHS (x1451) for assistance in evaluating alternative solvents.

I. Class I Controlled Substances
(The following chemicals are restricted by 40 CFR 82 and are to be phased out by January 1, 1996, except group VI, which is to be phased out by January 1, 2001.)

A. Group I
- $CFCl_3$ - Trichlorofluoromethane (CFC-11)
- CCl_2F_2 - Dichlorodifluoromethane (CFC-12)
- $CCl_2F\text{-}CClF_2$ - Trichlorotrifluoroethane (CFC-113)
- $CF_2Cl\text{-}CClF_2$ - Dichlorotetrafluoroethane (CFC-114)
- $CClF_2\text{-}CF_3$ - (Mono)chloropentafluoroethane (CFC-115)
- All isomers of the above

B. Group II
- CF_2BrCl - Bromochlorodifluoromethane (Halon 1211)
- CF_3Br - Bromotrifluoromethane (Halon 1301)
- $C_2F_4Br_2$ - Dibromotetrafluoroethane (Halon 2402)
- All isomers of the above

C. Group III
- CF_3Cl - Chlorotrifluoromethane (CFC-13)
- C_2FCl_5 - (CFC-111)
- $C_2F_2Cl_4$ - (CFC-112)
- C_3FCl_7 - (CFC-211)
- $C_3F_2Cl_6$ - (CFC-212)
- $C_3F_3Cl_5$ - (CFC-213)
- $C_3F_4Cl_4$ - (CFC-214)
- $C_3F_5Cl_3$ - (CFC-215)
- $C_3F_6Cl_2$ - (CFC-216)
- C_3F_7Cl - (CFC-217)
- All isomers of the above

D. Group IV

CCl_4 - Carbon tetrachloride

E. Group V

$C_2H_3Cl_3$ - 1,1,1-Trichloroethane (Methyl chloroform)

All isomers of the above except 1,1,2-Trichloroethane

F. Group VI

CH_3Br - Bromomethane (Methyl bromide)

G. Group VII

$CHFBR_2$
CHF_2Br (HBFC-2201)
CH_2FBr
C_2HFBr_4
$C_2HF_2Br_3$
$C_2HF_3Br_2$
C_2HF_4Br
$C_2H_2FBr_3$
$C_2H_2F_2Br_2$
$C_2H_2F_3Br$
$C_2H_2FBr_2$
$C_2H_3F_2Br$
C_2H_4FBr
C_3HFBr_6
$C_3HF_2Br_5$
$C_3HF_3Br_4$
$C_3HF_4Br_3$
$C_3HF_5Br_2$
C_3HF_6Br
$C_3H_2FBr_5$
$C_3H_2F_2Br_4$
$C_3H_2F_3Br_3$
$C_3H_2F_4Br_2$
$C_3H_2F_5Br$
$C_3H_3FBr_4$
$C_3H_3F_2Br_3$
$C_3H_3F_3Br_2$
$C_3H_3F_4Br$
$C_3H_4FBr_3$
$C_3H_4F_2Br_2$
$C_3H_4F_3Br$
$C_3H_5FBr_2$
$C_3H_5F_2Br$
C_3H_6FB

II. Class II Controlled Substances

This group of chemicals includes hydrochlorofluorocarbons (HCFCs), which add much less chlorine to the stratosphere than fully halogenated chlorofluorcarbons, but still present some threat to the ozone layer. These chemicals should be avoided unless no other alternative is feasible. However, this class of chemicals will be phased out in 2030, as outlined in the Clean Act Amendments of 1990. A list of these HCFCs can be found in 40 CFR 82, Appendix B to Subpart A. Contact EHS (x1451) if additional information is needed.